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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/498,773 02/05/00 BHAN

A PB-9907

022840 HM22/1012  
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EXAMINER

CRANE, L

ART UNIT

PAPER NUMBER

1623

DATE MAILED:

5  
10/12/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
09/498,773

Applicant(s)  
Bhan et al.

Examiner  
L. E. Crane

Group Art Unit  
1623

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

## Status

- ☒ Responsive to communication(s) filed on 08/28/00 (IDS)
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- ☒ Claim(s) 1-15 is/are pending in the application.
- Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 1-15 is/are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

- ☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been received.
- ☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 4 ☐ Interview Summary, PTO-413
- ☒ Notice of Reference(s) Cited, PTO-892 ☐ Notice of Informal Patent Application, PTO-152
- ☒ Notice of Draftsperson's Patent Drawing Review, PTO-948 ☐ Other \_\_\_\_\_

Office Action Summary

Art Unit 1623

The Group and/or Art Unit location of your application in the PTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Group 1600, Art Unit 1623.

5        No claims have been cancelled and no preliminary amendments filed as of the date of the instant Office action.

Claims 1-15 remain in the case.

10        Claims 6 and 8 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 6, last line, the term "phosphate" is technically incorrect. Did applicant intend to end the claim with the term -- group -- or the term -- moiety --? (The cyanoethyl group is the protecting group).

15        In claim 8, the term "may include from one to twenty carbon atoms" is open ended language which fails to properly define the metes and bounds of the instant claim. Applicant is respectfully requested to "particularly point out" the subject matter being claimed.

20        The following is a quotation of the appropriate paragraphs of 35 U.S.C. §102 that form the basis for the rejections under this section made in this Office action:

"A person shall be entitled to a patent unless -

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent."

Art Unit 1623

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States."

5 Claims 1-14 are rejected under 35 U.S.C. §102(b) as being anticipated by Hsiung '517 (PTO-892 ref. A).

10 Applicant is requested to note that the process of oligonucleotide and polynucleotide de-cyanoethylation disclosed by Hsiung relies on diethylamine to both remove cyanoethyl substituents and to scavenge the resultant acrylonitrile because the reagent is capable of acting, and is  
15 assumed to have acted, as both a basic reagent and a biproduct scavenger. In addition, the failure of applicant to clearly define the "cleaving reagent" and its site of action (no product structure has been clearly defined), the instant claims are deemed to include the possibility of no process step requiring a "cleaving reagent," a possibility required by claim 35 wherein  
the oligomer must be in solution so no cleavage from a solid support is either possible or necessary.

The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

20 "A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.  
25 Patentability shall not be negated by the manner in which the invention was made."

Claims 1-15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hsiung et al. (PTO-892 ref. A) in view of Pfeleiderer et al. '077 (PTO-1449 ref. A1).

Art Unit 1623

The instant claims are directed to a method of deprotecting the O-protected phosphotriesters of oligonucleotides by contacting same with an organic amine, particularly diethylamine.

5 Hsiung et al. discloses the use of organic amines, diethylamine in particular, to remove the cyanoethyl moiety from phosphate triesters which are intermediates in oligonucleotide synthesis.

Hsiung et al. does not expressly detail the application of this process to support bound oligonucleotides or include a second process of detachment from the solid support.

10 Pfleiderer et al. discloses at the paragraph describing Example 9 the contacting of a support bound oligonucleotide with a mixture of amines including piperidine to effect deprotection of the support bound oligonucleotide which is subsequently detached from the solid support by contacting same with ammonia. Pfleiderer et al. does not disclose the  
15 selective de-cyanoethylation of solid-support bound oligonucleotides.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the methodology of Hsiung et al. to the deprotection of support bound oligonucleotides like those found in Pfleiderer et al. because the disclosure of the selective deprotection by  
20 Hsiung et al. very closely analogous to the deprotection scheme of Pfleiderer et al.

One having ordinary skill in the art would have been motivated to combine these references because Pfleiderer et al. also uses amines to deprotect both phosphate and amino groups.

Art Unit 1623

Therefore, the instant claimed porotecc of selective phosphate deprotection would have been obvious to one of ordinary skill in the art having the above cited reference before him at the time the invention was made.

5        This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. §103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. §1.56 to  
10       point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. §103(c) and potential 35 U.S.C. §§102(f) or (g) prior art under 35 U.S.C. §103(a).

15       Papers related to this application may be submitted to Group 1600 via facsimile transmission(FAX). The transmission of such papers must conform with the notice published in the Official Gazette (1096 OG 30, November 15, 1989). The telephone numbers for the FAX machines operated by Group 1600 are (703) 308-4556 and 703-305-3592.

20       Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner L. E. Crane whose telephone number is 703-308-4639. The examiner can normally be reached between 9:30 AM and 5:00 PM, Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Gary Geist, can be reached at (703)-308-1701.

Serial No. 09/498,773

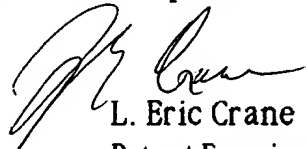
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Art Unit 1623

Any inquiry of a general nature or relating to the status of this application should be directed to the Group 1600 receptionist whose telephone number is 703-**308-1235**.

LECrane:lec

5 **10/10/00**



L. Eric Crane  
Patent Examiner  
Group 1600